SYM_ControlSym (3.1)
Level 2 Requirements

Requirements in the remainder of this document apply to both modes of operation listed below unless explicitly stated otherwise using the given notations:

- EXT : Externally Generated Telemetry (FEP), Commands (CMD)
    - Real-Time (actual current state)
    - Simulation (using external simulated data)
    - WSGT Telemetry

- RPL : Replay Saved Historical Telemetry, Commands, Events
    - Automatic playback: merged telemetry
    - User-requested playback: real-time replay or merged telemetry
    - WSGT Commands/Events
    -

SYM Modes of Operation

Mode	Telemetry Source	State Change Info	Event Source	Document Reference
Real Time Data	FEP	CMD	All - CCS	EXT
WSGT Playback	FEP	CNT (HICS)	CNT & All -CCS	EXT/RPL
Historical Replay (merged & non-merged)	CNT	CNT (HICS)	CNT	RPL
Simulation Data	TBD	TBD	TBD	EXT

Level 2 Requirements - SYM_ControlSym

The SYM_ControlSym shall manage initialization of other SYM functions (SYM_Dsd, SYM_Dtf, SYM_Ref, CCS SYM_Evt function). SYM_Cnt shall obtain and synchronize the replay of required historical information in replay mode. SYM_Cnt shall manage the export of command request from the SYM_RecoverFaults function. The SYM_Cnt function has three major subfunctions: SYM Initialization (SI), Manage Command Requests (MCR), and Manage Session (MGS).

1.1 The SYM Initialization function shall initialize the SYM_Dsd, SYM_Dtf, SYM_Ref, SYM_Evt functions. SI activities occur at system startup, after data dropout, and at the start of a replay.

1.2 The Manage Command Requests function shall receive all command requests from the SYM_Ref function, and determine whether or not they should be forwarded to the Command subsystem.

1.3 The Manage Session function shall obtain all required historical products from the Data Management subsystem. MGS shall synchronize the replay of telemetry, commands and events from these products to the SYM_Dsd and SYM_Evt functions.

Detail Level Requirements - SYM_ControlSym

SYM Initialization

The following section of the document presents the functional and detail level requirements for the *SYM_ControlSym* , *SYM Initialization (SI)* function.

(EXT)
1.1.1 The SI shall initialize all SYM functions at system startup.

> (Source: DLPs 4.02.02.02.01, 4.02.05.01.01, 4.03.04.01.01, Legacy Req'ts PRS CMD109)

1.1.2 The SI shall re-initialize all SYM functions after data dropout.

> (Source: DLPs 4.01.03.01.01, 4.02.02.02.01, 4.02.05.01.01, 4.03.04.01.01, Legacy Req'ts PRS CMD109)

1.1.3 The SI shall re-initialize all SYM functions on transition to a new PDB.

> (Source: DLPs 4.01.03.01.01)

(RPL)
1.1.4 The SI shall initialize all SYM functions prior to replaying a new set of telemetry data.

> (Source: DLPs 4.01.03.01.01)

> (RPL)
> 1.1.4.1 The SI shall receive notification when merged telemetry data becomes available in the Data Management subsystem archive. This notification shall be an event message sent via the SYM_ManageEvents function, and shall include the start/stop times of the merged data.
>
> (Source: DLPs 4.01.01.02.01)

(RPL)

1.1.4.1.1 The SI shall provide the capability for the CCS User, via the GUI subsystem, to enable/disable the automatic playback and monitoring of merged telemetry.

(Source: Top-Down Architecture)

(EXT)

1.1.4.2 The SI shall provide the capability, via the GUI subsystem, for the CCS user to enable/disable the automatic commanding.

(Source: Top-Down Architecture)

1.1.4.2.1 The SI shall send, to MCR, notifcation of user changes to command processing.

(RPL)

1.1.4.3 The SI shall accept requests, from the CCS user, via the GUI subsystem, for historical data playback.

(Source: DLPs 4.01.01.02.01)

1.1.4.3.1 The SI shall send, to MGS, notification to replay historical data.

1.1.5 The SI shall generate event messages for all significant failures and status updates.

(Source: Top-Down Architecture)

1.1.5.1 The SI shall assign all such event messages a criticality.

1.1.5.2 The SI shall send, to the SYM_ManageEvents function, all such event messages.

Manage Command Requests

The following section of the document presents the functional and detail level requirements for the *SYM_ControlSym , Manage Command Requests (MCR)* function.

1.2.1 The MCR shall receive, from the SYM_Ref function, command requests for the Command subsystem.

   (Source: Top-Down Architecture)

1.2.2 The MCR shall determine, based on system and user inputs, whether SYM_Ref generated command requests are permitted.

   (Source: Top-Down Architecture)

1.2.3 The MCR shall send command request to Command Processing.

   (Source: Top-Down Architecture)

1.2.4 The MCR shall receive response from Command Processing.

   (Source: Top-Down Architecture)

1.2.5 The MCR shall send, to the SYM_Ref function, command responses to the Command subsystem.

   (Source: Top-Down Architecture)

1.2.6 The MCR shall generate event messages for all significant failures and status updates.

   (Source: Top-Down Architecture)

   1.2.6.1 The MCR shall assign all such event messages a criticality.

   1.2.6.2 The MCR shall send, to the SYM_ManageEvents function, all such event messages.

Manage Session

The following section of the document presents the functional and detail level requirements for the *SYM_ControlSym , Manage Session (MGS)* function.

(RPL)
1.3.1 The MGS shall request for the desired time period, from the Data Management
       subsystem, the following archived Monitor Products:

- the Historical Integrated Command Schedule (HICS)
- replay (historical) telemetry data
- archived ES mnemonics/methods
- archived log of CCS-generated events
- archived derived parameter mnemonics/algorithms and delta value updates

(Source: 4.01.01.02.04, 4.01.01.03.01)

(RPL)
1.3.2 The MGS shall provide notification, to the SYM_Dsd function, when the next
       scheduled command was to be sent.

(Source: Top-Down Architecture)

(RPL)
1.3.3 The MGS shall provide notification, to the SYM_Dsd function, when the next
       scheduled command was sent.

(Source: Top-Down Architecture)

(RPL)
1.3.4 The MGS shall provide, to the Event Manager function, replayed real-time events.

(Source: Top-Down Architecture)

(RPL)
1.3.5 The MGS shall provide, to the SYM_Dsd, the replay telemetry data.

(Source: Top-Down Architecture)

(RPL)

1.3.6 Data originally staged in N minutes shall be played back at a rate, selectable by the CCS User via the GUI subsystem, from TBD to TBD times the original rate.

(Source: Top-Down Architecture)

(RPL)

1.3.7 The MGS shall generate event messages for all significant failures and status updates.

(Source: Top-Down Architecture)

1.3.7.1 The MGS shall assign all such event messages a criticality.

1.3.7.2 The MGS shall send, to the SYM_ManageEvents function, all such event messages.